SINCE 1881

FROEHLING & ROBERTSON, INC.

Engineering Stability Since 1881

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NC License #F-0266

November 22, 2017 (revised February 5, 2018)

North Carolina Department of Transportation
Geotechnical Engineering Unit
1020 Birch Ridge Drive
Raleigh, North Carolina 27610

Attn.: Mr. Gordon Box, L.G.
GeoEnvironmental Project Manager

Re: State Project: R-2530B
WBS Element: 34446.1.6
NC 24-27 from Bird Road in Albemarle to West of the Pee Dee River

Subject: **Preliminary Site Assessment**
Parcel #023 – GTR LLC (Shell / Alco Store)
1973 East Main Street
Albemarle, North Carolina
F&R Project #66V-0092

Dear Mr. Box:

Froehling and Robertson, Inc. (F&R) has completed the authorized Preliminary Site Assessment at the GTR LLC property located in Albemarle, North Carolina. The work was performed in general accordance with F&R's Proposal No. 1866-00132, dated June 14, 2017 (and revised June 22, 2017). Notice to Proceed was issued to F&R on July 6, 2017. This report documents our field activities, presents the results of laboratory analysis and provides estimated quantities of petroleum impacted soils.

Please do not hesitate to contact us if you should have any questions regarding this report.

Sincerely,

FROEHLING & ROBERTSON, INC.

DocuSigned by:
Benjamin A. Whitley
E425D6E8C23548B...

NORTH CAROLINA PROFESSIONAL SEAL 038743 ENGINEER BENJAMIN A. WHITLEY

DocuSigned by:
4DB7F275EBFD410...

Clint E. Sorrell
Environmental Scientist

Benjamin A. Whitley, P.E.
GeoEnvironmental Services Manager

FROEHLING & ROBERTSON, INC.

PRELIMINARY SITE ASSESSMENT

South Central Oil Company, Inc. (Parcel #023)
Shell / Alco Store
1973 East Main Street
Albemarle, North Carolina
State Project: R-2530B
WBS Element: 34446.1.6
F&R Project #66V-0092

November 22, 2017 (revised February 5, 2018)

Prepared for:

North Carolina Department of Transportation
Geotechnical Engineering Unit
1020 Birch Ridge Drive
Raleigh, NC 27610

TABLE OF CONTENTS

PAGE

Preliminary Site Assessment Report
GTR LLC Property (Parcel #023)
Albemarle, Stanly County, North Carolina
F&R Project No. 66V-0092

1.0 Introduction

Froehling and Robertson, Inc. (F&R) has prepared this Preliminary Site Assessment (PSA) Report to document soil assessment activities performed at the GTR LLC Property addressed as 1973 East Main Street, in Albemarle, Stanly County, North Carolina. The site is located on the northwest quadrant of the East Main Street and Barnard Street intersection as shown in Appendix I, Figures 1 and 2. As indicated in the Request for Technical and Cost Proposal (RFTCP), the site operates as a convenience store and gas station (Shell). According to the NCDEQ UST Section Registry, three tanks were installed in 2002 and are currently in use. The tank bed is located east of the canopy, approximately 60 feet north of East Main Street.

According to the NCDOT within their RFTCP, acquisition of right-of-way is necessary for the proposed NC24-27 design. As such, the NCDOT requested a PSA be performed to assess the possibility of encountering petroleum impacted soil from known or unknown USTs, and to locate USTs which may exist within proposed easements and right-of-way at the project site.

The PSA was performed in general accordance with F&R's Proposal No. 1866-00132, dated June 14, 2017 (and revised June 22, 2017) with Notice to Proceed issued to F&R by the NCDOT on July 6, 2017. The purpose of this report is to document field activities, present the results of laboratory analysis, and provide estimated quantities of petroleum impacted soils.

The existing on-site structure is one-story in height and is presumably constructed of brick and concrete masonry unit (CMU). The site also contains five self-service, and one automated, car washing bays. The remainder of the site consists of an asphalt paved parking lot and landscaped areas. The site is bordered to the north by Havoline Xpress Lube; to the south by East Main Street; to the east by Barnard Street; and to the west by a retail store front. Access to the site is gained from East Main Street to the south and Barnard Street to the east.

2.0 Geophysical Survey

Prior to F&R's soil assessment activities, Pyramid Environmental & Engineering, P.C. (Pyramid) conducted a geophysical survey to locate suspect metal underground storage tanks (USTs). The

geophysical work was conducted on July 23, 2017, and was performed within the proposed right-of-way and proposed drainage and utility easements of East Main Street.

The geophysical investigation consisted of electromagnetic (EM) induction surveys using a Geonics EM61 instrument. The EM61 data was collected along parallel survey lines spaced approximately 5 feet apart. Ground-penetrating radar (GPR) investigations were not performed at the project site. The data was reviewed in the field to evaluate the possible presence of USTs and later transferred to a desktop computer for further review. Isolated EM anomalies were identified on the site, including manholes, light poles, reinforced concrete pipe, storm drains, light debris, water meters, and signs.

Based on the EM data collected at the site, Pyramid did not observe anomalies that were interpreted to be the results of unknown metallic USTs within about 8 feet of the ground surface. The complete geophysical report is attached as Appendix II.

3.0 Site Assessment Activities

F&R visited the site on August 9, 2017 to perform the Preliminary Site Assessment. The assessment consisted of advancing 7 borings into the soils at the project site using direct-push technology (GeoProbe). The boring locations were determined by F&R staff based on the results of the geophysical survey, site features and proposed construction activities. Three of the borings (B-1 through B-3) were advanced on the southwestern portion of the site adjacent to East Main Street. Borings B-4 through B-7 were advanced on the southeastern portion of the site adjacent to East Main Street and Barnard Street. The borings were generally advanced to the proposed depth of 10 feet below ground surface (bgs). However, Borings B-3, B-4, B-6, and B-7 were terminated at depths ranging from 5 to 8 feet bgs, where GeoProbe refusal was encountered. Photos detailing existing site features are attached as Appendix III and boring locations are depicted in Figure 3 of this report.

Soil sample cores from the borings were collected in disposable, 4-foot long acetate sleeves. The soil samples were visually/manually classified and screened in the field using a calibrated photo-ionization detector (PID) for evidence of petroleum hydrocarbons. Evaluation of VOC concentrations were performed using a calibrated MiniRae 3000 PID which produces results in parts per million (ppm). A representative soil sample was collected from two foot sections of each sleeve and placed in a re-sealable plastic bag. The vapors were then allowed to equilibrate in the headspace of the bag for approximately ten minutes prior to measurement with the PID. The measurements were collected by placing the probe tip into the headspace of the bag. PID

measurements can be found in the GeoProbe Logs in Appendix IV, as well as in Table 1 in Section 5.0 below.

Generally, the soil sample in each boring which exhibited the highest PID concentration was submitted for laboratory analysis for diesel range organics (DRO), gasoline range organics (GRO), Total BTEX (benzene, toluene, ethylbenzene and xylenes), 16 PAHs (polycyclic aromatic hydrocarbons) and BaP (Benzo(a)pyrene) by Ultraviolet Fluorescence (UVF) technology (RedLab QED Hydrocarbon Analyzer).

The samples were collected in laboratory-supplied sample containers, placed in a cooler with ice, and shipped via UPS to RedLab in Wilmington, North Carolina following standard chain-of custody procedures.

4.0 Subsurface Conditions

As indicated in the attached GeoProbe Logs (Appendix IV), subsurface conditions from existing ground surface to boring termination primarily included various layers of dry to moist, orange-brown-gray-tan silty sandy clay; dry, brown, silty fine to medium sand; and dry tan silt. The borings were generally terminated at the proposed depth of 10 feet bgs. However, borings B-3, B-4, B-6, and B-7 were terminated at depths ranging from 5-8 feet bgs in interbedded layers of dry, dense silt.

PID readings ranged from 2.7 to 7.1 ppm, and petroleum odors and/or groundwater were not observed during field screening or sample collection activities.

5.0 Analytical Results

As shown in the following table, petroleum hydrocarbons identified as GRO were not encountered in the soil samples obtained from the site. Petroleum hydrocarbons identified as DRO were encountered in the soil samples at three boring locations advanced at the site (B-2, B-3, and B-7), at depths from 2 to 4 feet bgs (B-2, and B-7) to 4 to 5 feet bgs (B-3). The laboratory results indicate that the DRO concentrations ranged from 0.34 mg/kg (B-2) to 0.96 mg/kg (B-3), which are below the NCDEQ UST Section DRO Action Level of 100 mg/kg. Concentrations of BTEX were detected in the soil sample at one boring location advanced at the site (B-7), at a depth from 2 to 4 feet bgs. The laboratory results indicate that the BTEX concentration was detected at a concentration of 0.94 mg/kg, which is below the total NCDEQ Action level of 13.8056 mg/kg.

Table 1
Soil Sampling Analytical Results

Sample ID	Sample Date	Sample Depth (ft bgs)	PID Reading (ppm)	GRO (mg/kg)	DRO (mg/kg)	TPH (mg/kg)	Total BTEX (mg/kg)	Total Aromatics (mg/kg)	16 EPA PAHs (mg/kg)	BaP (mg/kg)
B-1	8/9/17	6-8	7.1	<0.9	<0.9	<0.9	<0.9	<0.18	<0.29	<0.036
B-2		2-4	7.1	<0.34	0.34	0.34	<0.34	0.52	<0.11	<0.014
B-3		4-5	4.9	<0.96	0.96	0.96	<0.96	1.2	<0.31	<0.038
B-4		6-8	4.5	<0.97	<0.97	<0.97	<0.97	<0.19	<0.31	<0.039
B-5		2-4	5.1	<0.36	<0.36	<0.36	<0.36	<0.07	<0.11	<0.014
B-6		0-2	4.6	<1	<1	<1	<1	<0.2	<0.33	<0.041
B-7		2-4	5.5	<0.94	0.94	0.94	0.94	1	<0.3	<0.038
NCDEQ Action Level				**50**	**100**	**NSE**	**13.8056**	**NSE**	**9,068.816**	**0.088**

TPH concentrations shown in bold exceed the NCDEQ Action Level as outlined in the NCDEQ, DWM, UST Section Guidelines
BTEX concentrations shown in bold exceed the total Soil-to-Water MSCC Level for those compounds
ppm = parts per millionppm = parts per million
GRO = Gasoline Range Organics
DRO = Diesel Range Organics
TPH = Total Petroleum Hydrocarbons
BTEX = Benzene, Toluene, Ethylbenzene and Xylenes
NSE = No Standard Exists

6.0 Conclusions and Recommendations

F&R conducted a PSA at the GTR LLC Property addressed as 1973 East Main Street, in Albemarle, Stanly County, North Carolina. A geophysical investigation was performed by Pyramid Environmental & Engineering to investigate the presence and location of USTs within proposed easements and right-of-way at the project site. Based on the results of the geophysical survey, it was determined that USTs were not present within the surveyed area. However, it should be noted that an active UST basin is located outside of the survey area.

Seven GeoProbe borings were advanced during the assessment within proposed easements and right-of-way, where grading activities and storm drain utilities are proposed in association with the NC 24-27 improvements. Based on the results of laboratory testing and observed PID readings, petroleum impacted soils were encountered in the vicinity of boring locations B-2, B-3, and B-7. Laboratory analysis detected concentrations of DRO at these locations; however, the concentrations of these compounds were below the NCDEQ UST Section DRO Action Level of 100 mg/kg.

It should be noted that a delineation of the soil contamination was not performed, as this was not included in the proposed scope of work. The above conclusions are based on interpretations of soil analytical results, PID readings and our experience with petroleum UST releases.

7.0 Limitations

These services have been performed, under authorization of the North Carolina Department of Transportation for specific application on this project. These services have been performed in accordance with generally accepted environmental and hydrogeological practices. No other warranty, expressed or implied is made. As with any subsurface investigation, actual conditions exist only at the precise locations from which samples were taken. Certain inferences are based on the results of sampling and related testing to form a professional opinion of conditions in areas beyond those from which samples were taken. Our conclusions and recommendations are based upon information provided to us by others, our sampling and testing results and our site observations. We have not verified the completeness or accuracy of the information provided by others, unless otherwise noted. Our observations are based upon conditions readily visible at the site at the time of our site visits.

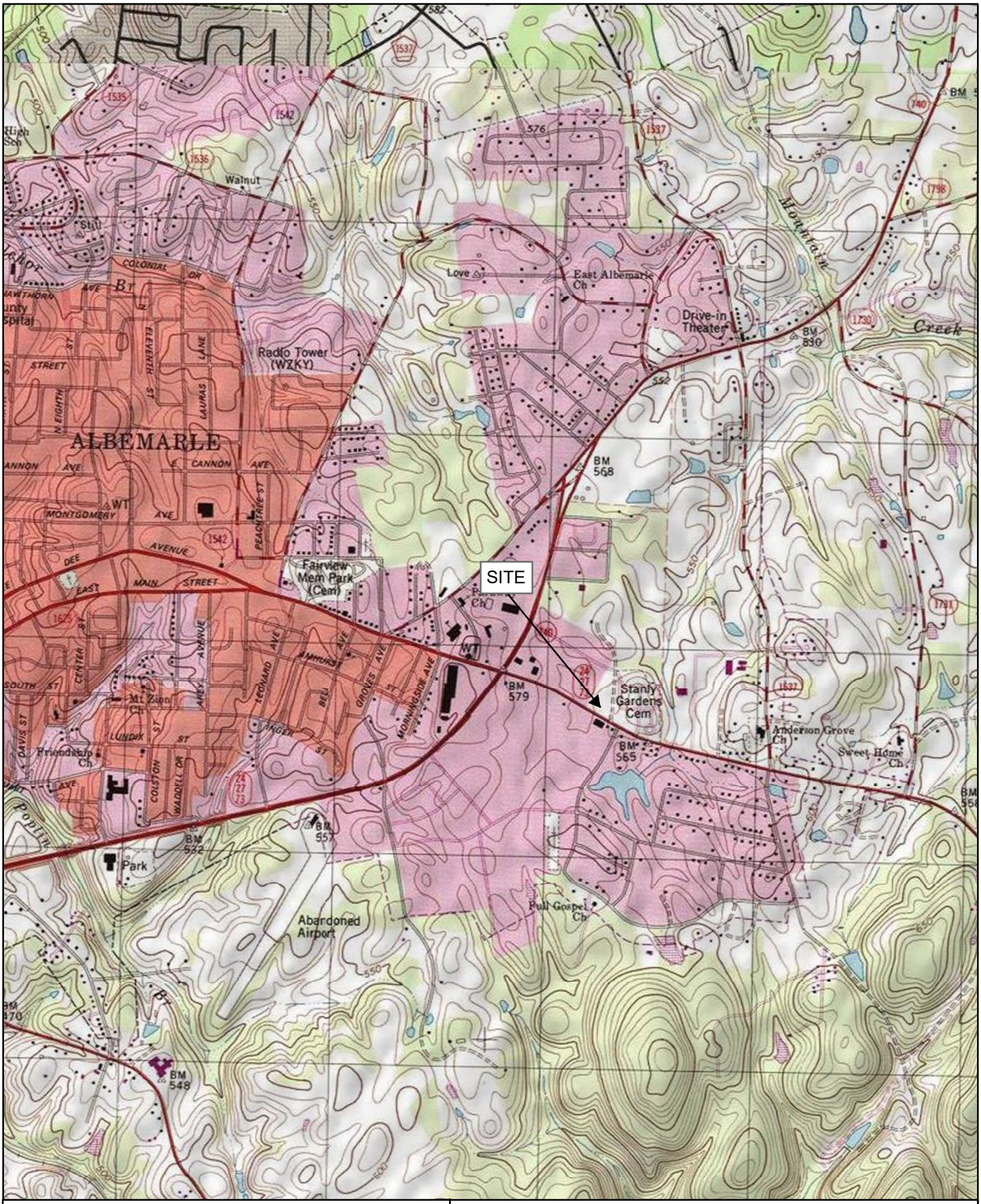
Froehling & Robertson, Inc. by virtue of providing the services described in this report, does not assume the responsibility of the person(s) in charge of the site, or otherwise undertake responsibility for reporting to any local, state or federal public agencies any conditions at the site that may present a potential danger to public health, safety or the environment. In areas that require notification of local, state, or federal public agencies as required by law, it is the Client's responsibility to so notify.

APPENDIX I

Figure No. 1 – TOPOGRAPHIC MAP

Figure No. 2 – SITE VICINITY MAP

Figure No. 3 – LABORATORY RESULTS & BORING LOCATION PLAN



SITE TOPOGRAPHIC MAP

0 1,000 2,000 4,000 6,000 Feet

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Client:	NCDOT
Project:	R-2530B PSAs
Location:	Parcel #023, Albemarle, NC
F&R Project No.:	66V-0092
Data:	USGS 2013
Date:	October 2017 (Revised Feb. 5, 2018)

Disclaimer: F&R makes no warranties or guarantees regarding the accuracy or completeness of geographic features shown on this map. Spatial accuracy of measurement provided by source agencies can be obtained by contacting F&R.

1973 East Main Street - Albemarle, North Carolina

Scale: 1:24,000 1 inch = 2,000 feet

FIGURE No.: 1

SITE VICINITY MAP

0 100 200 400 600 Feet

N

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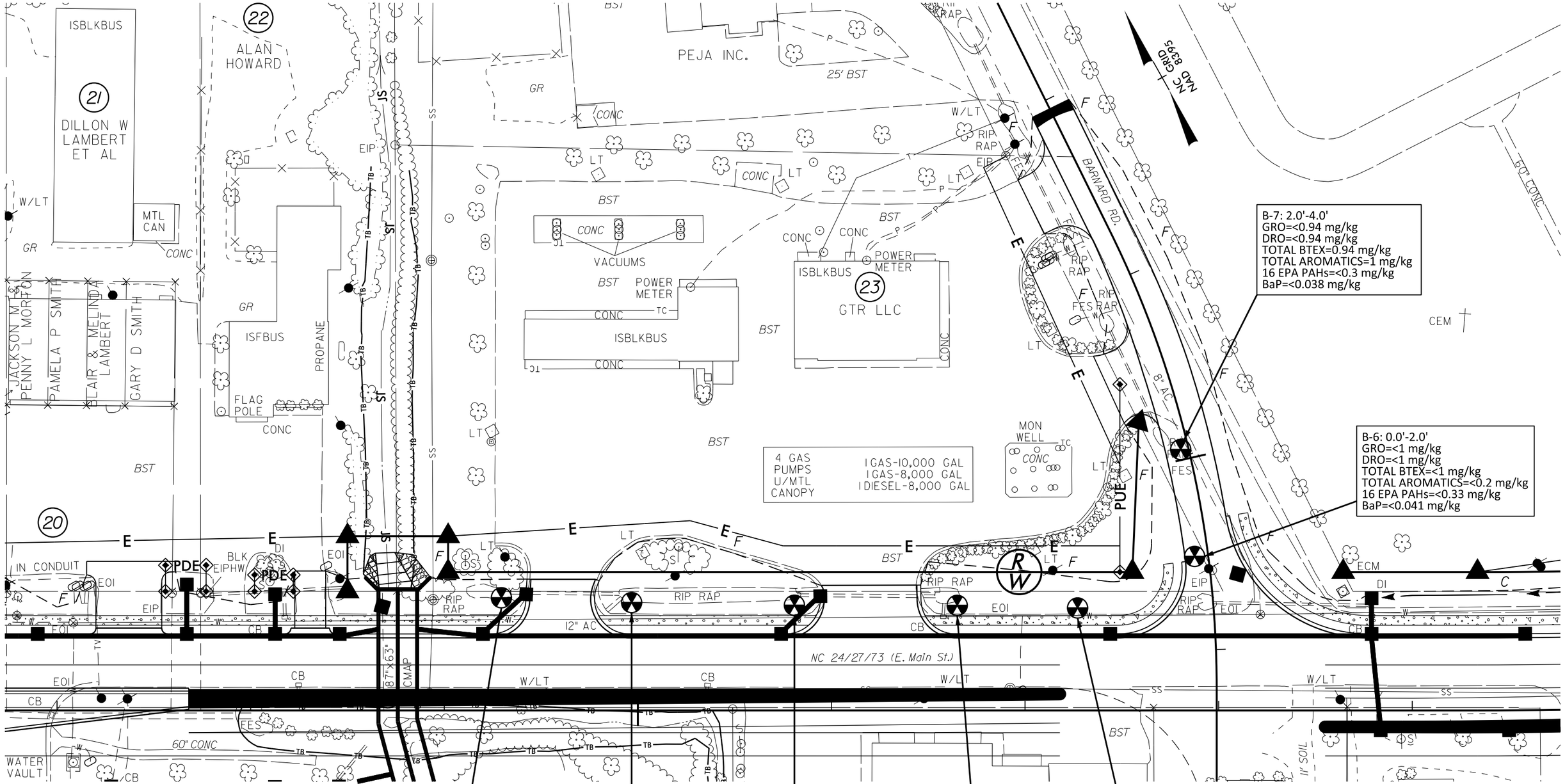
Client:	NCDOT
Project:	R-2530B PSAs
Location:	Parcel #023, Albemarle, NC
F&R Project No.:	66V-0092
Data:	ArcMap Imagery
Date:	October 2017 (Revised Feb. 5, 2018)

Disclaimer: F&R makes no warranties or guarantees regarding the accuracy or completeness of geographic features shown on this map. Spatial accuracy of measurement provided by source agencies can be obtained by contacting F&R.

1973 East Main Street - Albemarle, North Carolina

Scale: 1:2,400 1 inch = 200 feet

FIGURE No.: 2



SCALE (FEET)
0 25' 50'
1"=50'

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LEGEND

Approximate Geoprobe Boring Location

Sample data shown in bold exceed the NCDEQ Action Level as outlined in the NCDEQ DWM UST Section Guidance

LABORATORY RESULTS & BORING LOCATION PLAN

CLIENT: NCDOT		
PROJECT: R-2530B PSAs		
LOCATION: Albemarle, NC Parcel #023, 1973 East Main Street		
F&R PROJECT No.: 66V-0092		FIGURE No.: 3
DRAWN BY: T. T. Walker	CHECKED BY: B. Whitley, P.E.	
DATE: February 2018	SCALE: 1"=50'	

APPENDIX II

GEOPHYSICAL REPORT PREPARED BY PYRAMID

PYRAMID GEOPHYSICAL SERVICES
(PROJECT 2017-203)

GEOPHYSICAL SURVEY

METALLIC UST INVESTIGATION:
PARCEL 023
NCDOT PROJECT R-2530B

1973 E. MAIN STREET, ALBEMARLE, NC

AUGUST 28, 2017

Report prepared for:

Benjamin Whitley, P.E.
Froehling and Robertson
310 Hubert Street
Raleigh, North Carolina 27603

Prepared by: _____

Eric C. Cross, P.G.
NC License #2181

Reviewed by: _____

Douglas A. Canavello, P.G.
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C257: GEOLOGY C1251: ENGINEERING

GEOPHYSICAL INVESTIGATION REPORT
Parcel 023 – 1973 E. Main Street
Albemarle, Stanly County, North Carolina

Table of Contents

Figures

LIST OF ACRONYMS

CADD .....Computer Assisted Drafting and Design
DF .....Dual Frequency
EM.....Electromagnetic
GPR.....Ground Penetrating Radar
GPS .....Global Positioning System
NCDOT.....North Carolina Department of Transportation
ROW .....Right-of-Way
UST .....Underground Storage Tank

EXECUTIVE SUMMARY

Project Description: Pyramid Environmental conducted a geophysical investigation for Froehling & Robertson, Inc. (F&R) at Parcel 023, located at 1973 E. Main Street, Albemarle, NC. The survey was part of a North Carolina Department of Transportation (NCDOT) Right-of-Way (ROW) investigation (NCDOT Project R-2530B). F&R directed Pyramid as to the geophysical survey boundaries at the project site, which were designed to extend from the existing edge of pavement to the proposed ROW lines and/or easement lines within the property, whichever distance was greater. Conducted on July 23, 2017, the geophysical investigation was performed to determine if unknown, metallic underground storage tanks (USTs) were present beneath the survey area.

Geophysical Results: All of the EM anomalies were directly attributed to visible cultural features at the ground surface. For this reason, a GPR survey was not required. Collectively, the geophysical data did not show any evidence of unknown metallic USTs at Parcel 023. An active UST bed was located outside of the survey area.

INTRODUCTION

Pyramid Environmental conducted a geophysical investigation for Froehling and Robertson, Inc. (F&R) at Parcel 023, located at 1973 E. Main Street, Albemarle, NC. The survey was part of a North Carolina Department of Transportation (NCDOT) Right-of-Way (ROW) investigation (NCDOT Project R-2530B). F&R directed Pyramid as to the geophysical survey boundaries at the project site, which were designed to extend from the existing edge of pavement to the proposed ROW lines and/or easement lines within the property, whichever distance was greater. Conducted on July 23, 2017, the geophysical investigation was performed to determine if unknown, metallic underground storage tanks (USTs) were present beneath the survey area.

The site included an active service station surrounded by an asphalt parking area and grass medians. A known UST bed was located on the property outside of the survey area. An aerial photograph showing the survey area boundaries and ground-level photographs are shown in **Figure 1**.

FIELD METHODOLOGY

The geophysical investigation consisted of an electromagnetic (EM) induction-metal detection survey. Pyramid collected the EM data using a Geonics EM61 metal detector integrated with a Trimble AG-114 GPS antenna. The integrated GPS system allows the location of the instrument to be recorded in real-time during data collection, resulting in an EM data set that is geo-referenced and can be overlain on aerial photographs and CADD drawings. A boundary grid was established around the perimeter of the site with marks every 10 feet to maintain orientation of the instrument throughout the survey and assure complete coverage of the area.

According to the instrument specifications, the EM61 can detect a metal drum down to a maximum depth of approximately 8 feet. Smaller objects (1-foot or less in size) can be detected to a maximum depth of 4 to 5 feet. The EM61 data were digitally collected at

approximately 0.8-foot intervals along north-south trending or east-west trending, generally parallel survey lines, spaced five feet apart. The data were downloaded to a computer and reviewed in the field and office using the Geonics NAV61 and Surfer for Windows Version 14.0 software programs.

GPR data were not collected due to all EM anomalies being directly attributed to visible cultural features at the ground surface (see *Discussion of Results* section below).

Pyramid's classifications of USTs for the purposes of this report are based directly on the geophysical UST ratings provided by the NCDOT. These ratings are as follows:

Geophysical Surveys for Underground Storage Tanks
on NCDOT Projects

High Confidence	Intermediate Confidence	Low Confidence	No Confidence
Known UST Active tank - spatial location, orientation, and approximate depth determined by geophysics.	**Probable UST** Sufficient geophysical data from both magnetic and radar surveys that is characteristic of a tank. Interpretation may be supported by physical evidence such as fill/vent pipe, metal cover plate, asphalt/concrete patch, etc.	**Possible UST** Sufficient geophysical data from either magnetic or radar surveys that is characteristic of a tank. Additional data is not sufficient enough to confirm or deny the presence of a UST.	Anomaly noted but not characteristic of a UST. Should be noted in the text and may be called out in the figures at the geophysicist's discretion.

DISCUSSION OF RESULTS

Discussion of EM Results

A contour plot of the EM61 results obtained across the survey area at the property is presented in **Figure 2**. Each EM anomaly is numbered for reference in the figure. The following table presents the list of EM anomalies and the cause of the metallic response, if known:

LIST OF METALLIC ANOMALIES IDENTIFIED BY EM SURVEY

Metallic Anomaly #	Cause of Anomaly	Investigated with GPR
1	Manhole	
2	Light pole	
3	Reinforced concrete pipe	
4	Storm drain	
5	Light/debris	
6	Reinforced concrete pipe	
7	Water meters	
8	Light pole	
9	Reinforced concrete pipe	
10	Sign	

All of the EM anomalies were directly attributed to visible cultural features including a manhole, light poles, reinforced concrete pipes, a storm drain, debris, water meters, and a sign. For this reason, a GPR survey was not required.

Collectively, the geophysical data did not show any evidence of unknown metallic USTs at Parcel 023. An active UST bed was located outside of the survey area.

Figure 3 provides an overlay of the geophysical survey area onto the NCDOT MicroStation engineering plans (proposed ROW and easements) for reference.

SUMMARY & CONCLUSIONS

Pyramid's evaluation of the EM61 data collected at Parcel 023 in Albemarle, North Carolina, provides the following summary and conclusions:

- The EM61 survey provided reliable results for the detection of metallic USTs within the accessible portions of the geophysical survey area.
- All of the EM anomalies were directly attributed to visible cultural features at the ground surface. For this reason, a GPR survey was not required.

- Collectively, the geophysical data did not show any evidence of unknown metallic USTs at Parcel 023. An active UST bed was located outside of the survey area.

LIMITATIONS

Geophysical surveys have been performed and this report was prepared for F&R in accordance with generally accepted guidelines for EM61 surveys. It is generally recognized that the results of the EM61 surveys are non-unique and may not represent actual subsurface conditions. The EM61 results obtained for this project have not conclusively determined the definitive presence or absence of metallic USTs, but the evidence collected is sufficient to result in the conclusions made in this report. Additionally, it should be understood that areas containing extensive vegetation, reinforced concrete, or other restrictions to the accessibility of the geophysical instruments could not be fully investigated.

N

APPROXIMATE BOUNDARIES OF GEOPHYSICAL SURVEY AREA

View of Survey Area
(Facing Approximately Northwest)

View of Survey Area
(Facing Approximately Southeast)

TITLE
PARCEL 023 - GEOPHYSICAL SURVEY
BOUNDARIES AND SITE PHOTOGRAPHS

PROJECT
PARCEL 023
ALBEMARLE, NORTH CAROLINA
NCDOT PROJECT R-2530B

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(336) 335-3174 (p) (336) 691-0648 (f)
License # C1251 Eng. / License # C257 Geology

DATE 8/24/2017

CLIENT
FROEHLING & ROBERTSON

PYRAMID PROJECT #: 2017-203

FIGURE 1

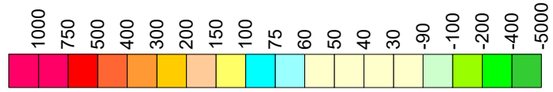
N

EM61 METAL DETECTION RESULTS

NO EVIDENCE OF UNKNOWN METALLIC USTs OBSERVED.

The contour plot shows the differential results of the EM61 instrument in millivolts (mV). The differential results focus on larger metallic objects such as USTs and drums. The EM61 data were collected on July 23, 2017, using a Geonics EM61 instrument. Verification GPR data were not required due to all EM anomalies being directly attributed to cultural features.

EM61 Metal Detection Response (millivolts)



TITLE
PARCEL 023 -
EM61 RESULTS CONTOUR MAP

PROJECT
PARCEL 023
ALBEMARLE, NORTH CAROLINA
NCDOT PROJECT R-2530B

PYRAMID GEOPHYSICS
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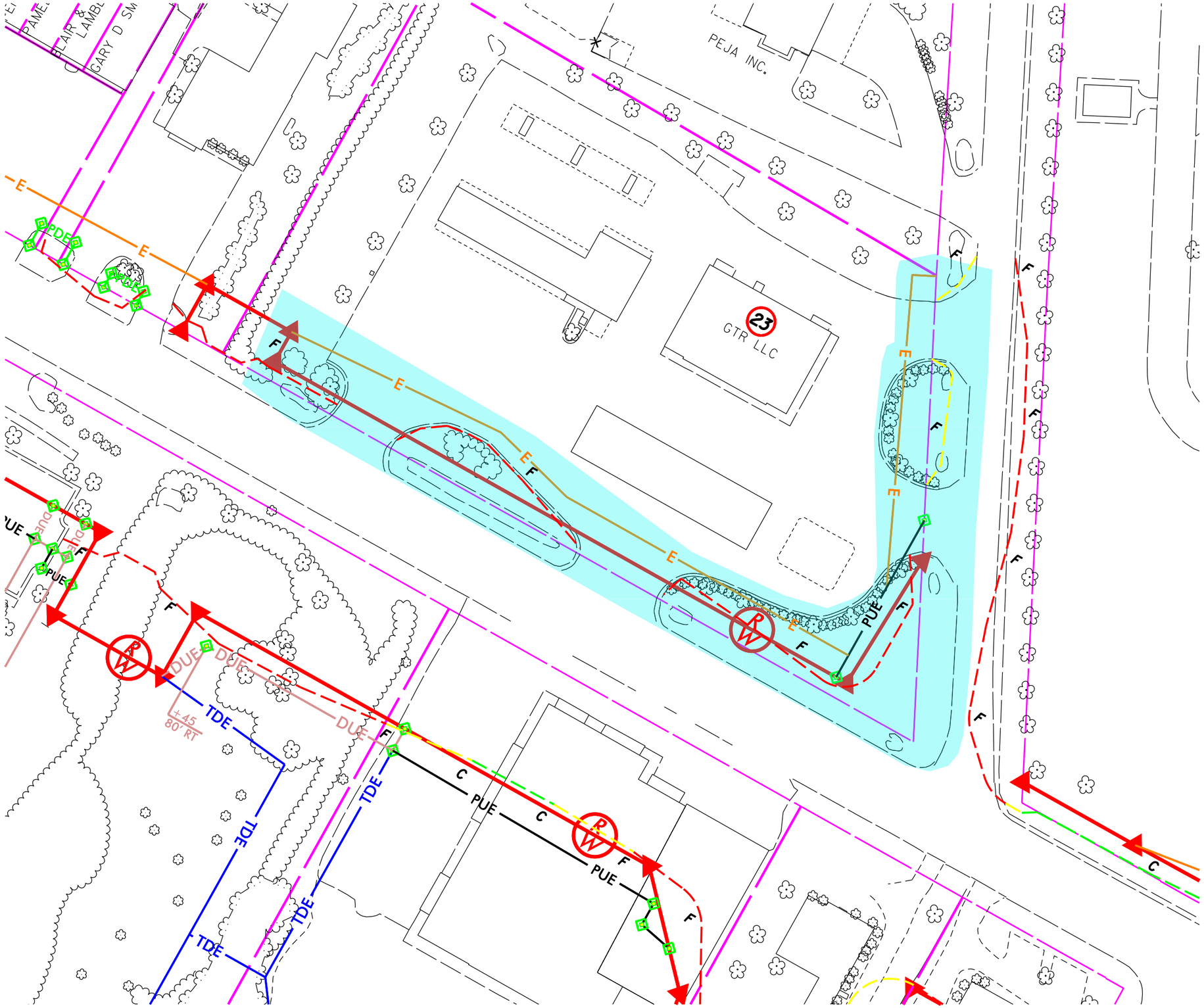
License # C1251 Eng. / License # C257 Geology

DATE 8/24/2017

CLIENT FROEHLING & ROBERTSON

PYRAMID PROJECT #: 2017-203

FIGURE 2



LEGEND

- EXISTING ROW
- EXISTING PROPERTY BOUNDARY
- PROPOSED ROW LINE
- E — TEMPORARY CONSTRUCTION EASEMENT
- PDE — PROPOSED PERMANENT DRAINAGE
- PUE — PROPOSED PERMANENT UTILITY
- PROPOSED SS CUT LINE
- PROPOSED SS FILL LINE
- GEOPHYSICAL SURVEY AREA

N

0 25 50
FEET

TITLE: OVERLAY OF GEOPHYSICAL SURVEY BOUNDARIES ON NCDOT ENGINEERING PLANS

PROJECT:
PARCEL 023
ALBEMARLE, NORTH CAROLINA
NCDOT PROJECT R-2530B

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License # C1251 Eng. / #C257 Geology

DATE: 8-24-17	REVISION NO. 0
PYRAMID PROJECT NO. 2017-203	FIGURE NO. 3

APPENDIX III

SITE PHOTOS

Photo #1: Boring location B-1, facing southeast.

Photo #2: Boring locations B-2 and B-3, facing southeast.

Photo #1: Boring locations B-3 and B-4, facing southeast.

Photo #2: Boring locations B-6 and B-7, facing south.

APPENDIX IV

GEOPROBE LOGS

FROEHLING & ROBERTSON, INC.

GEOPROBE LOG

Boring: P023 B-1 (1 of 1)

Project No: 66V-0092
Client: NCDOT
Project: R2530B PSAs
City/State: ALBEMARLE, NC

Elevation: EXISTING
Total Depth: 10.0'
Boring Location: SEE BORING LOCATION PLAN

Drilling Method: DIRECT PUSH
Hammer Type: Automatic
Date Drilled: 8/9/17
Driller: REGIONAL PROBING

Elevation	Depth	Description of Materials (Classification)	*Sample Depth (feet)	PID (ppm)	Remarks
		Moist Brown Silty Sandy Clay			One sample collected for laboratory analysis (6.0-8.0) No petroleum odors observed.
	2.0		2.0	3.9	
	4.0		4.0	5.4	
	6.0	Moist Orange Silty Clay	6.0	4.8	
	8.0		8.0	7.1	
	10.0	Geoprobe Boring Terminated at 10 feet.	10.0	4.9	

GEOPROBE_LOG BORING LOGS - COPY.GPJ F&R.GDT 11/1/17

FROEHLING & ROBERTSON, INC.

GEOPROBE LOG

Boring: P023 B-2 (1 of 1)

Project No: 66V-0092
Client: NCDOT
Project: R2530B PSAs
City/State: ALBEMARLE, NC

Elevation: EXISTING
Total Depth: 10.0'
Boring Location: SEE BORING LOCATION PLAN

Drilling Method: DIRECT PUSH
Hammer Type: Automatic
Date Drilled: 8/9/16
Driller: REGIONAL PROBING

Elevation	Depth	Description of Materials (Classification)	*Sample Depth (feet)	PID (ppm)	Remarks
		Moist Orange Brown Silty Sandy Clay			One sample collected for laboratory analysis (2.0-4.0) No petroleum odors observed.
	2.0		2.0	6.6	
	4.0		4.0	7.1	
	6.0	Moist Tan Orange Silty Clay	6.0	4.7	
	8.0		8.0	6.1	
	10.0	Geoprobe Boring Terminated at 10 feet.	10.0	5.3	

FROEHLING & ROBERTSON, INC.

GEOPROBE LOG

Boring: P023 B-3 (1 of 1)

Project No: 66V-0092
Client: NCDOT
Project: R2530B PSAs
City/State: ALBEMARLE, NC

Elevation: EXISTING
Total Depth: 5.0'
Boring Location: SEE BORING LOCATION PLAN

Drilling Method: DIRECT PUSH
Hammer Type: Automatic
Date Drilled: 8/9/17
Driller: REGIONAL PROBING

Elevation	Depth	Description of Materials (Classification)	*Sample Depth (feet)	PID (ppm)	Remarks
		Moist, Brown, Silty, Sandy, Clay			One sample collected for laboratory analysis (4.0-5.0) No petroleum odors observed.
	2.0		2.0	4.5	
	4.0	Dry, Tan, Silt	4.0	4.5	
	5.0	Geoprobe Boring Terminated by Direct Push Refusal at 5 feet.	5.0	4.9	

GEOPROBE_LOG BORING LOGS - COPY.GPJ F&R.GDT 11/1/17

FROEHLING & ROBERTSON, INC.

GEOPROBE LOG

Boring: P023 B-4 (1 of 1)

Project No: 66V-0092
Client: NCDOT
Project: R2530B PSAs
City/State: ALBEMARLE, NC

Elevation: EXISTING
Total Depth: 8.0'
Boring Location: SEE BORING LOCATION PLAN

Drilling Method: DIRECT PUSH
Hammer Type: Automatic
Date Drilled: 8/9/17
Driller: REGIONAL PROBING

Elevation	Depth	Description of Materials (Classification)	*Sample Depth (feet)	PID (ppm)	Remarks
		Moist, Brown, Silty Sandy Clay			One sample collected for laboratory analysis (6.0-8.0) No petroleum odors observed.
	2.0		2.0	4.1	
	4.0		4.0	4.6	
	6.0	Dry, Gray, Silty Sandy Clay	6.0	3.3	
	8.0	Geoprobe Boring Terminated by Direct Push Refusal at 8 feet.	8.0	4.5	

GEOPROBE_LOG BORING LOGS - COPY.GPJ F&R.GDT 11/1/17

FROEHLING & ROBERTSON, INC.

GEOPROBE LOG

Boring: P023 B-5 (1 of 1)

Project No: 66V-0092
Client: NCDOT
Project: R2530B PSAs
City/State: ALBEMARLE, NC

Elevation: EXISTING
Total Depth: 10.0'
Boring Location: SEE BORING LOCATION PLAN

Drilling Method: DIRECT PUSH
Hammer Type: Automatic
Date Drilled: 8/9/17
Driller: REGIONAL PROBING

Elevation	Depth	Description of Materials (Classification)	*Sample Depth (feet)	PID (ppm)	Remarks
		Moist, Orange Brown, Silty Sandy Clay			One sample collected for laboratory analysis (2.0-4.0) No petroleum odors observed.
	2.0		2.0	4.1	
	4.0		4.0	5.1	
	6.0	Moist, Gray, Silty Clay	6.0	3.8	
	8.0		8.0	4.1	
	10.0	Geoprobe Boring Terminated by Direct Push Refusal at 10 feet.	10.0	3.9	

GEOPROBE_LOG BORING LOGS - COPY.GPJ F&R.GDT 11/1/17

FROEHLING & ROBERTSON, INC.

GEOPROBE LOG

Boring: P023 B-6 (1 of 1)

Project No: 66V-0092
Client: NCDOT
Project: R2530B PSAs
City/State: ALBEMARLE, NC

Elevation: EXISTING
Total Depth: 7.0'
Boring Location: SEE BORING LOCATION PLAN

Drilling Method: DIRECT PUSH
Hammer Type: Automatic
Date Drilled: 8/9/17
Driller: REGIONAL PROBING

Elevation	Depth	Description of Materials (Classification)	*Sample Depth (feet)	PID (ppm)	Remarks
		Moist, Brown, Silty Sandy Clay			One sample collected for laboratory analysis (0.0-2.0) No petroleum odors observed.
	2.0		2.0	4.6	
	4.0	Moist, Tan, Silty Sandy Clay	4.0	3.5	
	6.0	Dry, Gray Brown, Silt	6.0	3.1	
	7.0	Geoprobe Boring Terminated by Direct Push Refusal at 7 feet.	7.0	2.7	

GEOPROBE_LOG BORING LOGS - COPY.GPJ F&R.GDT 11/1/17

FROEHLING & ROBERTSON, INC.

GEOPROBE LOG

Boring: P023 B-7 (1 of 1)

Project No: 66V-0092
Client: NCDOT
Project: R2530B PSAs
City/State: ALBEMARLE, NC

Elevation: EXISTING
Total Depth: 5.5'
Boring Location: SEE BORING LOCATION PLAN

Drilling Method: DIRECT PUSH
Hammer Type: Automatic
Date Drilled: 8/9/17
Driller: REGIONAL PROBING

Elevation	Depth	Description of Materials (Classification)	*Sample Depth (feet)	PID (ppm)	Remarks
		Moist, Brown, Silty Sandy Clay			One sample collected for laboratory analysis (2.0-4.0) No petroleum odors observed.
	2.0		2.0	4.0	
	4.0	Dry, Light Brown, Silty Fine to Medium Sand	4.0	5.5	
	5.5	Geoprobe Boring Terminated by Direct Push Refusal at 5.5 feet.	5.5	5.0	

GEOPROBE_LOG BORING LOGS - COPY.GPJ F&R.GDT 11/1/17

APPENDIX V

LABORATORY ANALYTICAL RESULTS

QED

REDLAB RAPID ENVIRONMENTAL DIAGNOSTICS

QROS

Hydrocarbon Analysis Results

Client: F & R
Address: 310 HUBERT ST
RALEIGH, NC 27603

Contact: BEN WHITLEY

Project: NCDOT - R2530B - P023

Samples taken Wednesday, August 9, 2017
Samples extracted Wednesday, August 9, 2017
Samples analysed Monday, August 14, 2017

Operator PANTESCO

U04049

Matrix	Sample ID	Dilution used	BTEX (C6 - C9)	GRO (C5 - C10)	DRO (C10 - C35)	TPH (C5 - C35)	Total Aromatics (C10-C35)	16 EPA PAHs	BaP	% Ratios			HC Fingerprint Match
										C5 - C10	C10 - C18	C18	
s	P023 B1 (6-8)	36.1	<0.9	<0.9	<0.9	<0.9	<0.18	<0.29	<0.036	0	89.8	10.2	Residual HC
s	P023 B2 (2-4)	13.7	<0.34	<0.34	0.34	0.34	0.52	<0.11	<0.014	0	38	62	Deg.PHC 43.3%,(FCM),(BO),(P)
s	P023 B3 (4-5)	38.2	<0.96	<0.96	0.96	0.96	1.2	<0.31	<0.038	0	48.5	51.5	Deg.PHC 48.6%,(FCM),(BO)
s	P023 B4 (6-8)	38.8	<0.97	<0.97	<0.97	<0.97	<0.19	<0.31	<0.039	0	0	100	Residual HC,(BO)
s	P023 B5 (2-4)	14.3	<0.36	<0.36	<0.36	<0.36	<0.07	<0.11	<0.014	0	0	0	,(FCM)
s	P023 B6 (0-2)	40.6	<1	<1	<1	<1	<0.2	<0.33	<0.041	0	0	100	Residual HC,(BO)
s	P023 B7 (2-4)	37.7	<0.94	<0.94	0.94	0.94	1	<0.3	<0.038	0	0	100	Residual HC,(BO),(P)

Initial Calibrator QC check OK

Final FCM QC Check OK 100.4 %

Concentration values in mg/kg for soil samples and mg/L for water samples. Soil values uncorrected for moisture or stone content. Fingerprints provide a tentative hydrocarbon identification.

Abbreviations :- FCM = Results calculated using Fundamental Calibration Mode : % = confidence of hydrocarbon identification : (PFM) = Poor Fingerprint Match : (T) = Turbid : (P) = Particulate detected

B = Blank Drift : (SBS)/(LBS) = Site Specific or Library Background Subtraction applied to result : (BO) = Background Organics detected : (OCR) = Outside cal range : (M) = Modifed Result.

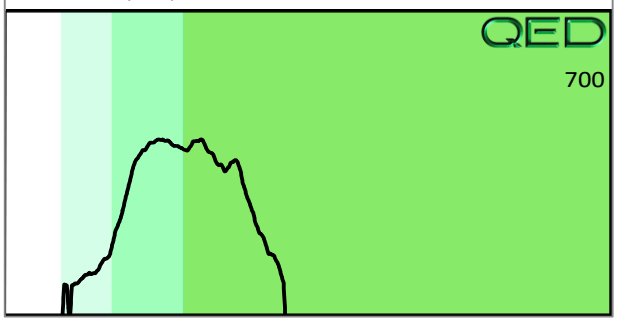
% Ratios estimated aromatic carbon number proportions : HC = Hydrocarbon : PHC = Petroleum HC : FP = Fingerprint only. **Data generated by HC-1 Analyser**

QED Hydrocarbon Fingerprints

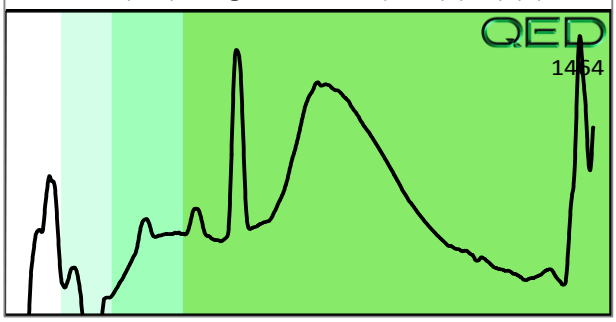
Project: NCDOT - R2530B - P023

Monday, August 14, 2017

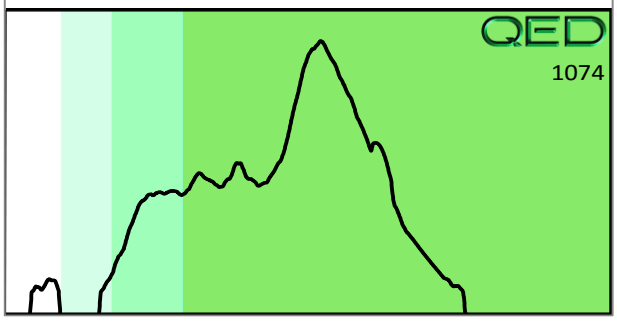
P023 B1 (6-8) : Residual HC



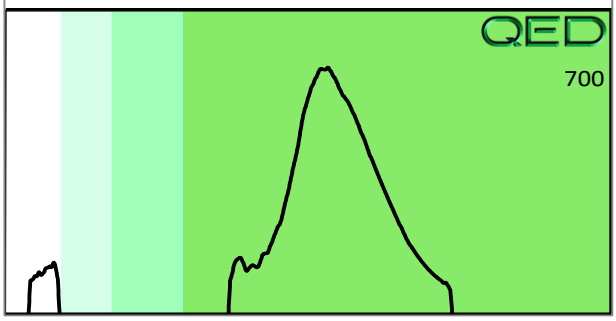
P023 B2 (2-4) : Deg.PHC 43.3%,(FCM),(BO),(P)



P023 B3 (4-5) : Deg.PHC 48.6%,(FCM),(BO)

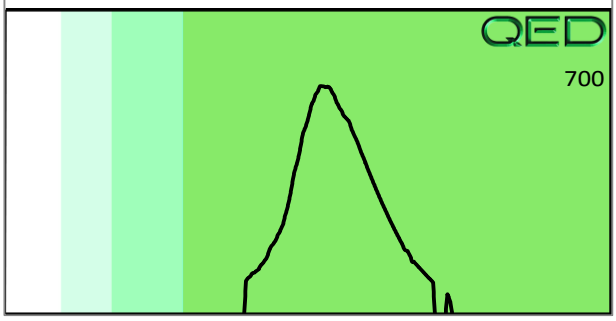


P023 B4 (6-8) : Residual HC,(BO)

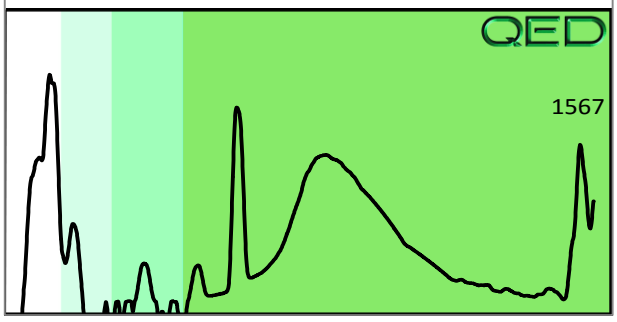


P023 B5 (2-4) : ,(FCM)

P023 B6 (0-2) : Residual HC,(BO)



P023 B7 (2-4) : Residual HC,(BO),(P)



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